A. Summary Information Page

i. Project Title: Oakridge 2019 Targeted Airshed Program

ii. Applicant Information:
Lane Regional Air Protection Agency
Merlyn L. Hough, P.E., BCEE, Director
1010 Main Street, Springfield OR 97477
(541) 736-1056 x216, merlyn@lrapa.org

iii. Total Project Cost:
Total cost of the project: $4,938,190
Amount of funding requested from EPA: $4,938,190
This grant proposal *does not* offer a match but does list the previous investments in the City of Oakridge's air quality and human health from all the ongoing stakeholders. These add up to approximately $32,279,700 and were made from 1987 to 2018, but the majority of that funding has come in the past 10 years. Oakridge residents contributed approximately $750,000 for these ducted and ductless systems.

iv. Project Period: May 2019 to May 2024 (5-year period)

v. Short Project Description
LRAPA, the City of Oakridge and a broad coalition of stakeholders will deliver a full program to ensure permanent reductions in emissions from woodsmoke as well as provide air filtration for when vulnerable populations can't escape it. The primary strategies include: weatherization and repair to reduce the need for heat; installing ductless heat pumps to provide local emission-free heat; certified woodstoves for resiliency, for a community that frequently loses power; clean and dry wood through a community firewood program; air filters for smoke refuge; health and air quality tracking; and a suite of education and enforcement actions to ensure health standards are met.

vi. Place of Performance: Oakridge/Westfir, Oregon Nonattainment Area

vii. Unique Entity Identifier: DUNS number 09-500-2994

B. Project Summary and Approach

i. Detailed project summary and description of the specific approaches, activities and technologies:
For the last three decades, the health of residents of Oakridge in rural Oregon, has been compromised due to poor air quality due to high concentrations of $PM_{2.5}$ during the winter months and from wildfire smoke as climate change progresses. Local climate and topography (the city sits in a bowl of ridgelines) make the City of Oakridge prone to wintertime temperature inversions, low wind speeds and poor atmospheric dispersion which exacerbates the concentrations of smoke from uncertified woodstoves and improper burning techniques (more than 80% of $PM_{2.5}$ is attributed to woodsmoke in winter). The City of Oakridge's airshed is moving into attainment and has made considerable progress since 2007, where the 24-hour particulate matter count was 47 micrograms per cubic meter (µg/m3). This has been due in large part to many of the community stakeholders working programmatically and ad hoc to improve the air quality. It is the expressed goal of this project to decrease and sustain that number to below 30 µg/m3. The intent of this project is to advance the continued and permanent reduction of particulate matter over the next five years and establish the infrastructure and programs that can sustain those reductions

for the next generation of renters and homeowners. Specifically, the stakeholders to this project are eager to move toward "finishing the job." Historically, the stakeholders have disproportionately contributed resources to this effort (versus other communities they are supposed to serve) and have exhausted their ability to contribute dollars but are still contributing program support. This mitigation program will prioritize efforts to target low-income populations and those that suffer environmental injustice. The primary strategies include: weatherization and repair to reduce the need for heat; installing ductless heat pumps to provide local emission-free heat; certified woodstoves for resiliency, for a community that frequently loses power; clean and dry wood through a community firewood program; air filters for smoke refuge; health and air quality tracking; and a suite of education and enforcement actions to ensure health standards are met.

To provide an approach that will work with residents and ensures that their resiliency is not obstructed by having a secondary heating source, a multi-tiered approach is necessary.

- **Weatherization and home repairs**
    - **Product and benefit:** Residential weatherization will reduce the need for home heating energy use while providing co-benefits of comfort, reduced energy bills, supporting local contractors and improving air quality. Repairs are slated only for components related to weatherization – such as repairs of holes in roofs or walls.
    - **Activities:** (1) Resident applies for EPA funded program (2) Certified contractor completes an energy efficiency audit of the residence to determine weatherization potential and relevant heating system conversion and installation (3) weatherization work is completed which reduces heating load requirements and reduces future energy usage.
    - **Technologies:** Wall, ceiling and floor insulation, window replacements to ensure a tighter building envelope and sealing of ducts or other draft locations.
- **Heating system conversions for both renters and homeowners**
    - **Product and benefit:** All households benefit from the installation of heating system conversions by reducing costs and reducing woodsmoke. ***While the program focuses on low-income households first, the smoke from any household sinks to the bottom of the city's topographic bowl and hovers in the poorest neighborhoods.*** For this environmental justice concern – all wood burners will be targeted for destruction of non-certified stoves or installation of a wood stove insert to an open fireplace and installations of heat pumps to reduce the need to burn. Certified woodstoves will also be provided to those that need them as back-up heat when power is out and for the eventual large Cascadia earthquake (which is predicted to cause power to be out for weeks after).
    - **Activities:** (1) Resident applies for EPA funded program (2) Certified contractor completes an energy efficiency audit of the residence to determine weatherization potential and relevant heating system conversion and installation; (3) Heating appliance audit and installation performed by contractor (overseen by LRAPA); provide resident with model options (ductless heat pump, ducted heat pump, certified woodstove) based on particulate matter reductions (4) Resident chooses the model they are most interested in and the heating system is installed with guaranteed uncertified woodstove removal (uncertified woodstoves are labeled and tracked for guaranteed destruction).
    - **Technologies:** (1) Ductless heat pumps: (power rating of 12,000-15,000 BTUs or ~1500 W, capable of maintaining comfortable temperatures in the residence during colder days – 100% capacity down to -5°) (2) Ducted heat pumps: smaller overall number, for residences where zonal heating is not appropriate. (3) Certified wood stoves: Wood stoves will need to

meet Stage II EPA performance standards to ensure the lowest echelon of particulate matter emissions.

- **Program development and management**
    - **Product and benefit:** The program will not just manage the weatherization and heating system conversions, the program will also manage the elements of: community and school education to help people understand what they can do to improve air quality and how to keep warm; compliance enforcement and diversion program to ensure that illegal burning does not occur on red days; expansion of the community firewood program to ensure that people have access to affordable dry wood; and the ongoing pursuit of additional funding from private sources to ensure that the community can make heating systems conversions and maintain good air quality into the future. Additionally, the program manager will serve to coordinate with agencies (e.g., City of Oakridge, LRAPA, Oregon DEQ, US EPA) on reattainment and the City's involvement in that process for resource sharing and meeting individual mandates cooperatively.
    - **Activities:** (1) Enhanced compliance and diversion program: the Oakridge municipal court manages a diversion program for first-time offenders, offering an educational course instead of a fine. (2) Community and school education: The City and partners distribute educational materials explaining wood-burning advisories, wood-burning techniques, and alternatives to wood heat. (3) Expansion of the Community Firewood Program: The Community firewood has been ad hoc and reliant on donations of wood at the right time and at the right moisture content.
    - **Technologies:** Computers, phones and cars to get to meetings.
- **Increased AQ and Health monitoring frequency and equipment**
    - **Product and benefit:** Increased frequency of $PM_{2.5}$ monitoring will allow for a more complete data set and tracking of the outcomes of the other program activities. Development and ongoing maintenance of health-based data in cooperation with the School District and health authorities.
    - **Activities:** Increase current $PM_{2.5}$ monitoring frequency from 1 in 3 days to daily. Install a continuous EPA approved PM monitor for hourly, and shorter frequency, data. Install up to 10 low-cost PM monitors to measure the PM levels in other areas of the community not directly located near the permanent monitoring site. Identify between schools, health officials and clinics an anonymous way to track health data in relation to emissions data.
    - **Technologies:** (1) EPA approved FRM $PM_{2.5,}$ filter-based, sampler running on a daily frequency. (2) EPA approved FEM Continuous PM sampler for daily, hourly and shorter frequency, time averaged data collection. (3) Low-cost PM monitors for use in areas not represented by the permanent monitoring site. Health data will be tracked in Excel.
- **Air filters for schools, public buildings and households**
    - **Product and benefit:** In times of poor air quality – whether it is from woodsmoke from home heating or woodsmoke from wildfire, the population cannot escape the air. We are proposing retrofits for the public buildings to provide refuge from air quality concerns especially for the younger and elderly populations.
    - **Activities:** Develop program for air filtration giveaways for households in Oakridge and to have all public buildings retrofitted for filtration of $PM_{2.5}$ in the existing heating and cooling systems for the schools and public buildings.
    - **Technologies:** (1) For households – heat pump attached or standalone air filters with washable filters to avoid the need for ongoing purchase of filters. (2) For schools and public

buildings – retrofits for the existing HVAC systems to ensure that the indoor air quality is not compromised by woodsmoke from heating or from wildfire.

ii. Description of how activities will achieve ongoing, significant reductions of $PM_{2.5}$:

- The efforts in Oakridge to improve air quality have been active for nearly three decades and have made positive strides yet work remains. The strategies proposed in this document have evolved through trial and error and are sensitive to the many unique situations of the residents of Oakridge. Generally speaking, we will: (1) work from lowest income household to highest household income; (2) use the technological interventions that make homes comfortable, affordable and resilient while improving air quality; (3) expand employment through the work on homes – both rented and owned; (4) leverage the recent Community Firewood Program feasibility study to establish an ongoing program that provides year-round dry firewood to the community and work to wildfire fighters that live in the community; and (5) install air filters to ensure that children, low-income and elderly populations can access safe air in events that affect them that they cannot control.

Permanent	Operational - Ongoing	Episodic
Ductless Heat Pumps (DHP)	Community firewood program	Curtailment
Certified woodstove replacements	Education - small, hot, low/no damper fires	Air filters - schools and residences
Weatherization	Opacity	
	Code Enforcement	
AQ Coordinator		

iii. Description of our analysis of the emissions inventory for the nonattainment area.

Oregon and LRAPA have been leaders for many years in effectively reducing particulate emissions from home wood heating. To illustrate, here are two examples from the 1980s that provided the overall framework for strategies to reduce PM_{10} and $PM_{2.5}$ in several Oregon airsheds: A Comprehensive Strategy to Reduce Residential Wood Burning Impacts in Small Urban Communities and Oregon's Woodstove Certification Program.

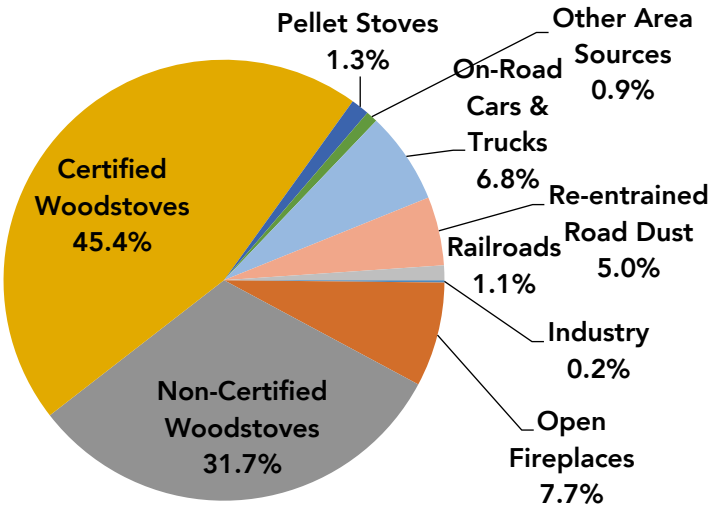
The $PM_{2.5}$ emission inventories for the Oakridge area for 2008 and 2015 were included in the Oakridge 2016 $PM_{2.5}$ Attainment Plan ("2016 Plan"). Woodsmoke contributes 75-85% of PM emissions in the Oakridge airshed. The 2016 Plan was adopted by the LRAPA Board of Directors on November 10, 2016, approved and incorporated into the State Implementation Plan (SIP) by the Oregon Environmental Quality Commission (EQC) on January 18, 2017, and approved by the U.S. Environmental Protection Agency (EPA) on February 18, 2018 [83 FR 5537] effective March 12, 2018. Residential Wood Combustion (RWC) emissions from certified and non-certified woodstoves, fireplaces and pellet stoves were identified as the major source of $PM_{2.5}$ emissions on worst winter days contributing to violation of the national air quality health standard (NAAQS) for $PM_{2.5}$.

Therefore, the $PM_{2.5}$ control strategy in the 2016 Plan focused on the reduction of RWC emissions; this EPA Targeted Airshed Grant also will focus on the reduction of RWC emissions. The 2008 and 2015 emission inventories are summarized in the 2016 Plan on pages 19-30; details are included in Appendix 1; the emission inventory methodologies are outlined in Appendix 3-D. The emission inventory calculations for this EPA Targeted Airshed Grant are consistent with the methodologies in the EPA-approved 2016 Plan.

The modeled air quality improvements resulting from the $PM_{2.5}$ emission reductions in this EPA Targeted Airshed Grant will be calculated according to the same methodologies coordinated with EPA Region 10 in the EPA-approved 2016 Plan. The modeling methods are summarized on pages 33-39 of the 2016 Plan, including the Positive Matrix Factorization (PMF) of speciated $PM_{2.5}$ data, the Sulfate, Adjusted

Nitrate, Derived Water, Inferred Carbonaceous Material Balance Approach (SANDWICH) speciation formulation, and the Rollback Model. Details on PMF are included in Appendix 3-E-2. Details on SANDWICH are included in Appendix 3-E-1. Details on Rollback Modeling are included in Appendix 3-H.

The emission reductions and air quality improvements achieved during 2008-2015 are summarized in Table 12 on page 43 of the 2016 Plan, including Long-Term $PM_{2.5}$ reductions of 38 pounds per day (2.6 ug/m3) and Short-Term $PM_{2.5}$ reductions of 107 pounds per day (7.1 ug/m3) on worst winter days. We expect the PM2.5 emission reductions and air quality improvements from this TAG project to be greater than the 2008-2015 progress, as outlined in Section E of this application. The 2008 PM2.5 emission inventory, before implementation of the 2008-2015 strategy, is summarized in the following pie chart.



Oakridge $PM_{2.5}$ Emission Inventory for 2008 Worst Winter Days.

iv. A description of how the proposed activity is an innovative, well-conceived strategy for achieving the greatest amount of emission reductions possible from a given source, supporting the lowest emission activities available.

We have described above the strategies above that have evolved over nearly three decades through both structured programmatic pulses and ad hoc activities from all the stakeholders. The essential barriers we are overcoming through this collection of strategies are:

- **The city sits in a natural bowl of ridgelines:** Barring removal of a section of ridgeline or relocation of the town, woodsmoke will stay in town and settle into the lower elevation, poor neighborhoods.
- **Large low-income population and forest-based way of life:** Oakridge is a former logging and wood-products town that has many residents struggling to make ends meet without those industries being active. Approximately 45% receive public healthcare. The city is surrounded by national and privately held forest in all directions. For generations, residents have burned wood for heat in the winter as a cost-effective way to stay warm that is not always dependent on electricity, which is more expensive and is subject to winter power outages.
- **Natural gas is not available in the community for home heating:** While propane can be found in the community, it is relatively expensive due to the remoteness of the community. There are no natural gas pipelines near the city, nor will there ever be per the local gas utilities.

- **Distrust of government:** Many residents in this area communicate regularly during air quality events that they resent the enforcement of the air quality standards in that they believe they are being "forced to buy" equipment and electricity when everything is "fine". Our education program will not only help them understand that their own health is actively compromised, but that the program is there to help households that cannot afford the transition to cleaner and more convenient heat.
- **Not "just-another-changeout-program":** The addition of a supplemental heat source with the ease, convenience, and low cost like an electric ductless heat pump will start to change the habits of most wood burners without removing their woodstoves. Previous change out efforts have been not gained much traction in the community when forced to go from wood combustion to a complete alternative. Residents are resistant to give up wood-burning altogether, but the addition of an alternative source (and also owning a certified wood stove) has anecdotally shown that the amount of wood burned has decreased in these homes (with residents burning a cord or two less per winter). Residents do not believe that these electrical appliances are as affordable to run as they are marketed to be until they have their own experience with them. With additional weatherization improvements, the heating and retaining of the heat will be at peak efficiency. Residents are also more attracted to this supplemental program as it provides the option for air conditioning in the winter, filtering the air with heavy smoke episodes, and raising the value of their homes.
- **Challenge of wildfire contribution to particulate matter:** Oakridge will experience a growing challenge in the summer months in the increased incidence of wildlife. These types of events will likely adversely affect Oakridge's air quality and reattainment plan adherence.
- **Air filters:** Unfortunately, there will be times when the residents cannot escape the woodsmoke from home heating or wildfire. We want to provide them refuge without having to leave their community.

v. How the application supports EPA's Strategic Plan:

- **Goal 1 – "Provide Americans with Clean Air":** This program is primarily designed to reduce emissions that are *controllable* in the homes of the community members, given enough resources to make the changes. The program also proposes to go beyond reduction in emissions and to provide healthy buildings to occupy when the conditions are not healthy and are *uncontrollable* – especially wildfire smoke and the lower income neighborhoods that must breathe the emissions from the entire community.
    - **Objective 1.1 – Measuring Air Quality and ensuring Americans live and work in areas meeting high air quality standards:** LRAPA already maintains an air monitoring station in the most acute/intense areas of concern. This proposed program expansion would deploy Purple Air monitors as part of the education and outreach process and will be used to raise awareness and provide better data from around the city. Further, this program expansion would include engaging schools, health authorities, health care providers and pharmacies to collect indicator data such as respiratory illness reports from health care providers, sales of medicine such as inhalers and school day absences associated with poor air quality events. Oregon Health Authority (OHA) staff believe that school absenteeism may be the best data source for showing a baseline and improvement of air quality on community health. Also, Trillium and Orchid Health (local clinics) could be good sources of data. Both Dr. Luedtke (director) of Lane County Public Health and OHA staff have strongly encouraged the woodsmoke coordinators to track claims data through the Community Care Organization – Trillium. ESSENCE data and Oakridge Emergency Medical Services (EMS) data could prove useful as well.
- **Goal 2 – Cooperative Federalism:** This request aims to expand a strong, existing program that has been assembled with the state DEQ, the City of Oakridge's Mayor and Council, Lane County (health

and economic development departments), the Lane Regional Air Protection Agency, the local electric utility Lane Electric, the state housing authority, the state forestry department, the US Forest Service, and several nonprofits dedicated to rural economic development including Southern Willamette Forest Collaborative, St. Vincent DePaul focusing on poverty alleviation and job creation, state and federal legislators, and the Governor's office. In short, the existing and proposed expansion of the program involves the right groups to provide services, but in cooperation to better distribute resources, provide visibility of the process and to simply be effective.

- **Goal 3 – Rule of Law and Process:** (1) *Compliance* – part of the request is for additional dollars to support local enforcement combined with education and diversion programs as needed; (2) *Consistency* – with expanded support for local enforcement, we can assure the community that everyone will be in compliance or have the opportunity to come into compliance with financial assistance; (3) *Prioritize Robust Science* – this proposal aims to expand community air quality monitoring overseen by LRAPA to ensure ever better data as well as work to track other indicator data such as school sick days; (4) *Streamline and Modernize* – the intent of this program expansion request is to not only get to all local, and willing households, but also to keep a fresh and up-to-date inventory of any new housing to ensure a future program that is targeting only the new sources; (5) *Improve Efficiency and Effectiveness* – by expanding an already successful program and consolidating ad hoc activities into a program, we will be able to get to the current problem, but also set the stage for handling any new controllable threats to air quality in real time.
- **Replicable program:** Oakridge is but one of many rural communities in Oregon and the U.S. that face woodsmoke concerns. We hope to share what is working and what is not in an easy to use guidebook. While Oakridge is unique in its bowl-shaped topography, our existing and proposed expansion of the program will be codified into a "How-to Guidebook" for other communities to learn from and act on. This includes the multifaceted approach to education, enforcement, and financial assistance.

C. Community Benefits, Engagement and Partnerships

COMMUNITY BENEFITS

- **Community health:** The residents' health of Oakridge and Westfir is compromised by soot from wood burning during the winter months. This means the residents are more likely to have respiratory and cardiac challenges, disease, and are more likely to develop cancer. Reducing the need to heat through weatherization and installing heat pumps to displaces the need for wood heating which reduces wood smoke. Replacing non-certified wood stove with certified stoves and providing clean and dry firewood reduces emissions for anyone living in the nonattainment area. Further, by providing air filtration to households and public buildings we can provide additional refuge from unhealthy air when it occurs regardless of source, especially for those neighborhoods at the bottom of the topographic bowl.
- **Economic impacts and burdens:** The particulate matter issues are a discouraging challenge for many potential businesses interested in starting or moving to Oakridge. Additional permit requirements and the potential for increased expenses to meet air quality regulations often cause these businesses to seek different locations. Ever since the large mill shut down in the 1980's, the City of Oakridge has been unable to attract large businesses or industry. The majority of the city's economic interests are tied up in tourism and the growing mountain biking recreation business, but looming summer wildfires and wintertime wood smoke endanger those activities as well. These environmental factors deeply affect the economic potential for the city and its residents year-round.

- **Addressing the needs and concerns of the community including Environmental Justice and the existing burdens:** Community concerns range from economic viability of the town to the environmental justice disproportionality of the population. The non-attainment area of Oakridge-Westfir has a small population of 4,146 people. Within this population, the high low-income population are most impacted by environmental justice factors. Oakridge-Westfir ranks in the 84th and 81st percentile against state and national averages of low-income populations. This means that only 16% of the state and 19% of the country have higher rates of low-income populations than Oakridge. The demographic indicators from EJ SCREEN also show a high population of people over 64 years old. Oakridge-Westfir is ranked in the 91st and 93rd percentile when compared to state and national averages. The American Community Survey information indicates that this area has lower numbers of minorities at 11%. Although the overall EJ score may appear to be less impactful because of the lower number of minority populations, it is clear the area struggles with high numbers of low-income and an older population that is generally more vulnerable to health impacts from pollution factors. Further breakdown of the EJ SCREEN data shows a disproportionate number of low-income and older populations live in the Willamette City neighborhood of Oakridge, located Southwest of the city's boundary. This area is where the LRAPA air quality monitor is located and consistently observed to be the area of the worst air quality through saturation studies.

EJSCREEN Report (Version 2018)

the User Specified Area, OREGON, EPA Region 10

Approximate Population: 4,146

Input Area (sq. miles): 20.20

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Demographic Indicators							
Demographic Index	33%	29%	65	29%	66	36%	53
Minority Population	11%	23%	23	27%	21	38%	23
Low Income Population	54%	35%	84	32%	86	34%	81
Linguistically Isolated Population	0%	3%	49	3%	46	4%	44
Population With Less Than High School Education	22%	10%	89	10%	90	13%	80
Population Under 5 years of age	1%	6%	5	6%	4	6%	5
Population over 64 years of age	28%	16%	91	14%	93	14%	93

COMMUNITY ENGAGEMENT AND PARTNERSHIPS

The community will be engaged based on previous efforts: The community has been engaged in many different efforts across the last three decades. The City of Oakridge has received and continues to leverage resources in order to resolve air quality issues in the community and airshed. *This request for funding aims to finish the last set of implementation strategies to ensure better air quality*. LRAPA, Lane Electric, and Homes for Good each committed funding for Oakridge projects in 2018. *Please see the Section H – Leveraging Previous Contributions for more detail on each partners contributions to date.*

- **Current and past efforts:** LRAPA is working directly with Good Company, the contractor team that the City of Oakridge hired through a competitive process, to manage the woodsmoke program with funding from Oregon DEQ's Woodsmoke grant program. Good Company previously staffed the pilot of the Warm Homes Clean Air program in 2006 and staffed the Oregon Solutions project that developed the mitigation plan and the resource development plan on behalf of the stakeholders in 2017 (see photo below for Declaration of Cooperation photo below for the Oregon Solutions project). Additionally, Good Company was hired to develop the Community Firewood Program

feasibility study as part of Oregon Department of Forestry grant funding. Their current role as Oakridge Woodsmoke Coordinator covers: (1) Resource development for program expansion; (2) Project management of mitigation plan stakeholders in weatherization, heat pump installations and wood stove upgrades (coordination and data gathering); and (3) Community education and outreach including support of the community firewood program to reach the residents. The funding for this woodsmoke coordinator role expires in June 2019.

- **Stakeholders and involved partner organizations:** Beyond the City of Oakridge, stakeholders that have been involved over the last five years to improve air quality in Oakridge include:
    - **Lane Regional Air Protection Agency (LRAPA):** (Primary Applicant) LRAPA is the local government agency that monitors the airshed and collects air quality data and acts as the local air quality regulator and program administrator. LRAPA has a key understanding of the Oakridge airshed and the environmental impacts that come with home wood heating.
    - **Southern Willamette Forest Collaborative (SWFC):** SWFC is a local nonprofit organization under the fiscal sponsor Cascade Pacific RC&D. The SWFC is a community-based forest collaborative group that brings together community members, elected officials, community organizations as well as state and federal agencies to find forest management solutions for the Southern Willamette forest area.
    - **Additional partners include:** Homes for Good, Inbound LLC, Lane County, Lane Electric, Oregon Department of Forestry (ODF), Oregon Department of Environmental Quality (DEQ), Oregon Housing and Community Services (OHCS), Regional Solutions (Oregon Governor), St. Vincent De Paul Society, Sustainable Northwest, and U.S. Forest Service (USFS).

D. Project Sustainability

We expect that this grant, if awarded, will complete the current effort to convert homes to zero or lower emissions technologies. The second five-year maintenance period will likely see dramatically lower resource needs to ensure the ongoing reduction of woodsmoke emissions – most likely from trailer homes being brought into town. Because Oregon law requires the removal of any non-certified woodstoves and only the installation of certified stoves at the moment of a house sale, or the construction of a new one, the program financial requirement will reduce dramatically and remain focused on education and outreach. The community firewood program will provide clean and dry wood and the compliance enforcement will decrease dramatically to require only a fraction of existing staff

time to keep community members from burning, and when they do, burning the right wood, the right way, in the right appliances. We estimate that post-conversion, the program administration, monitoring and enforcement will take 40-50% of an annual FTE, well within the existing staffing of LRAPA.

- **Self-funded improved utilization of wood:** The Community Firewood Program will ensure that when households do burn wood, they burn seasoned wood which equates to less wood being burned and lower air emissions. *Further, much of this wood will be removed from forestry slash piles which are currently open burned and expose locals to air hazards.* The feasibility study and business plan for this program, developed by the current woodsmoke coordinators, indicates the need for an expansion of the program beyond Oakridge that could make it financially self-sustaining.

E. Environmental Results—Outcomes, Outputs and Performance Measures

EXPECTED PROJECT OUTPUTS AND OUTCOMES

Outputs	*Outcomes*
- Replace all existing uncertified wood stoves. Approximately 145 remaining. Replace with certified wood stoves or pellet stoves.	Reduced PM emissions. The expected permanent emission reductions per year are 12,246 lb. PM2.5, 1,120 lb. NOx, 160 lb. SO2, 21,210 lb. VOC, and 680 lb. NH3. The expected lifetime emission reductions are 306 tons PM2.5, 28 tons NOx, 4 tons SO2, 530 tons VOC, and 17 tons NH3, based on 50-year life (heat pumps may require some maintenance-replacement at 15-20 years). ***More importantly for the 24-hr standard, $PM_{2.5}$ emissions on worst days will be reduced by 191 lb./day and PM2.5 concentrations will be reduced by 12.8 ug/m3, reducing the 2015-2017 Design Value of 46 ug/m3 to 33.2 ug/m3.***
- Install 145 Ductless Heat Pumps as alternative heat sources.	
- Install upgraded weatherization for 145 of homes.	
- Install air filters for three schools and 2,024 residences.	
- Sell 200 cords of dry, seasoned wood through community firewood program. - Increase code enforcement program for curtailment and opacity compliance, and education outreach.	

PERFORMANCE MEASURES – WHAT WE WILL TRACK

Overseeing project partners, subrecipients, and/or contractors and vendors

- Quarterly progress reports and meetings with data on activities listed in tracking and reporting actual accomplishments

Tracking and reporting project progress on expenditures, purchases, and other fiscal activities

- Quarterly reports of program dollars invested by strategy and meetings

Tracking and reporting actual accomplishments versus proposed outputs/outcomes and proposed timelines/milestones

- Number and % of weatherized homes (quarterly tracking/reporting)
- Number and % of installed heat pumps (quarterly tracking/reporting)
- Number and % of removed and destroyed uncertified stoves (quarterly tracking/reporting)
- Number and % of certified woodstoves installed (quarterly tracking/reporting)
- Number of dry cords of wood sold by community firewood program (annual tracking/reporting)
- Reduction in firewood use (annual tracking/reporting)

- Number and % of public buildings with air filters installed (annual tracking/reporting)
- Number and % of residences given air filter (annual tracking/reporting)
- Number of people reached for education (quarterly tracking/reporting)
- Number of enforcement visits (quarterly tracking/reporting)

Measuring and reporting on emission reductions

- Air quality improvements via LRAPA monitors and sensors
- Calculate PM emission reductions
- Cost per ton of $PM_{2.5}$ reduction per strategy

Measuring and reporting on human health

- Sick days at schools correlated with "red days" or wildfire smoke days
- Respiratory and heart visits to health clinics correlated with "red days" or wildfire smoke days
- Inhalers and respiratory relief products sold at the pharmacy correlated with "red days" or wildfire smoke days.

PERFORMANCE PLAN – HOW WE WILL TRACK

For every strategy and performance measure, we will create a templated reporting form for all of the contractors and vendors to report to LRAPA quarterly. These filled-in templated reports will also provide evidence as relevant of the performance being observed. For every major contributor to the effort and the strategies they are implementing, we will establish a quarterly meeting with them to review the performance, discuss any challenges and troubleshoot them and adjust course as needed.
With all the data, we will report quarterly to EPA in a rolled-up template of the performance compared to expected outcomes and outputs. A brief narrative will describe what we are learning and where we are adjusting our efforts.

TIME SCHEDULE AND TASKS

Strategy/Action	2019	2020	2021	2022	2023
Contracting and Reporting	Initial contracting & start quarterly reports	Quarterly reports	Quarterly reports	Quarterly reports	Quarterly / Final report & presentations
Monitoring	Continuous	Continuous	Continuous	Continuous	Continuous
Education	Fall to Spring	Fall to Spring	Fall to Spring	Fall to Spring	Fall to Spring
Weatherization	Ramping – household identification, bidding	Full scale – procurement, installation	Full scale – procurement, installation	Full scale – procurement, installation	Taper
Heat Pumps	Ramping – household identification, bidding	Full scale – procurement, installation	Full scale – procurement, installation	Full scale – procurement, installation	Taper
Woodstove destruction	Ramping – household identification, bidding	Full scale – removal & destruction	Full scale – removal & destruction	Full scale – removal & destruction	Taper
Certified Woodstoves	Ramping – household	Full scale – procurement, installation	Full scale – procurement, installation	Full scale – procurement, installation	Taper

	identification, bidding				
Community Firewood Program	Site development and ramp up	Full scale – program growth	Full scale – program growth	Full scale – program growth	Full scale – program growth
Air filters	Schools and public buildings procurement / installations	Residence procurement / installations	Monitoring	Monitoring	Monitoring
Compliance	Continuous	Continuous	Continuous	Continuous	Continuous

F. Programmatic Capability and Past Performance

MANAGEMENT, COMPLETION AND REPORTING REQUIREMENTS

Federally funded assistance agreements similar in size, scope and relevance to Oakridge 2019 Targeted Airshed Program that LRAPA has performed within the last three years:

1. EPA Section 105 CAA-Base Grant # 98055708

Total Project: $3,107,770 with an EPA share of $1,196,8313

- Project Period: 07/01/2014 – 06/30/2016
- CFDA: 66.001 Air Pollution Control Program Support
- This project closed on target and the requirement for MOE was met.

2. EPA Section 105 CAA-Base Grant # 98055709

Total Project: $3,237,770 with an EPA share of $1,199,819.00

- Project Period: 07/01/2016 – 12/31/2018
- CFDA: 66.001 Air Pollution Control Program Support
- This project is closing on target and has met the management of the agreement.

3. EPA Section 105 CAA-Base Grant # 98055710

- Total Project: $3,626,000 with an EPA share: $1,224,215
- Project Period: 07/01/2018 – 06/30/2020
- CFDA: 66.001 Air Pollution Control Program Support
- This project is currently on schedule and meeting the management requirements of the agreement.

ORGANIZATIONAL EXPERIENCE AND PLAN

LRAPA celebrated its fiftieth anniversary as the local air quality control agency in Lane County, Oregon in 2018. Over the years LRAPA has received numerous Federal and State grants and has consistently followed the terms set by the grantee agency for all the projects in which LRAPA has been involved. Among the projects are:

- City of Portland Sunday Walkway Project (EPA)
- Clean Fuel for Bridges Program (EPA)
- Clean Fuel for School Busses Program (EPA)
- Everybody Wins Program to install auxiliary power units (APUs) in trucks on the I-5 corridor to act as a power source during idling (EPA, State of Oregon and other sources)
- Northwest Regional Ethanol Distribution Network (DOE)

STAFF EXPERTISE

Merlyn Hough – Grant Project Manager
Merlyn Hough is the Director of the Lane Regional Air Protection Agency (LRAPA) in Springfield-Eugene, Oregon, responsible for overall direction of the regional air quality agency for Lane County since 2005. Before LRAPA, he worked as environmental program manager (1994-2005) and senior environmental engineer (1981-1994) for the Oregon Department of Environmental Quality (ODEQ) in the air quality and waste management programs. At LRAPA, Merlyn coordinated the 2016 Oakridge-Westfir $PM_{2.5}$ Attainment Plan that was approved by EPA as part of the Oregon State Implementation Plan (SIP). At ODEQ, he developed air pollution control strategies for PM_{10}, Ozone and Carbon Monoxide in several airsheds throughout Oregon that were approved by EPA as part of the SIP.

Jo Niehaus, MPA – Grant Project Assistant
Jo has been the Public Affairs Manager at Lane Regional Air Protection Agency since 2014. In her role, she is the principal spokesperson for the agency and coordinates all marketing, strategic communication and education. She has been actively involved In the Oakridge smoke mitigation plan during her tenure at LRAPA and continues to work on $PM_{2.5}$ matters ranging from wildfires to winter woodsmoke. Her expanded communication strategies include but are not limited to: text message and email alerts for woodsmoke curtailment days, social media geotag marketing, website content management, and physical brochures, flyers, and outreach materials. Jo has been involved with the Oakridge community through town hall meetings, outdoor school education programs, fire safety demonstrations, and other community events.

Nasser Mirhosseyni – Grant Financial Officer
Nasser has been with LRAPA since October 2006. He oversees the daily operations of the Agency's financial and human resources activities, and the LRAPA Enterprise Programs (Airmetrics) operation. Nasser is responsible for financial planning, fund investment and revenue enhancement, grant writing, grant management, accounting and auditing, payroll, billing and collection. During his tenure with LRAPA, Nasser has managed several federally-funded projects from the EPA and the DOE including the CAA section 105, EPA Base Grant. As part of the CAA 105, Nasser administered contracts with the University of Washington and Washington State University on behalf of the Northwest AirQuest and the Regional Modeling Consortium as a service to state and local air agencies within EPA Region 10 since July 2014 and it will continue through June 30, 2020.

Lance Giles – Grant Data Quality Administrator
Lance is the Air Monitoring and Data Quality Coordinator at the Lane Regional Air Protection Agency (LRAPA). In his 25 years at LRAPA, Lance has been Involved in the operation, maintenance and calibration of ambient air monitoring equipment and sites. Lance has also been involved in many short-term air quality studies to validate monitoring sites and to test new and emerging technologies. Lance currently oversees the air monitoring section of LRAPA and is responsible for the collection and quality assurance of the data collected from the air monitoring that occurs in LRAPA's jurisdiction.

Joshua Proudfoot, MA – Lead Contractor
Josh is principal of Good Company, the active contractor for City of Oakridge's Woodsmoke Coordinator acting as project manager. Josh has worked three times with Oakridge and LRAPA over the last ten years on Governor-designated efforts for program development and stakeholder alignment. Josh has worked on scores of air quality initiatives including diesel, woodsmoke, industrial emissions and GHG mitigation cooperative public and private collaborations.

Justin Overdevest, MBA – Contractor
Justin is a Senior Associate at Good Company and is deputy project manager for the current Oakridge Woodsmoke Coordinator role. Justin has worked twice in the last two years with Oakridge and LRAPA in aligning the local stakeholders into the development of a mitigation plan as well as resource development. He also has led the feasibility and business planning efforts for the community firewood program and contributed to an air quality local regulatory authority feasibility study for the City of Portland and Multnomah County. Justin regularly works on GHG mitigation projects with both public and private clients.

G. Budget

i. **Description of the budget and estimated funding amounts for each work component/task.** The budget for this project is $4,938,190 and covers the aforementioned strategies and cost centers of (1) program and infrastructure costs, (2) personnel and staffing, and (3) additional costs. The majority of project funds are going to the weatherization and heating system replacements. Additional program elements of air filters, PM sensors, future replicability guidebook, community firewood program equipment and site materials, and education are the other program elements. Personnel and staffing include costs from four main sources and organizations: LRAPA personnel, contractor staff, local code enforcement officer and management and oversight of weatherization and heating system replacements. Additional costs include fringe benefits and indirect costs. See below (iii) and attached budget (SF-424A) for itemized costs for each of these project components.

ii. **Description of the applicant's approach, procedures, and controls for ensuring that awarded grant funds will be expended in a timely and efficient manner:** LRAPA is the local air quality agency for Lane County Oregon and follows all the requirements that are deemed necessary as a local government entity in terms of budgeting and procurement policies. LRAPA follows the compliance requirements as local government entity in the State of Oregon hence its procumbent policy meets the requirements and approval of Oregon DOJ. Over the years LRAPA has received numerous Federal and State grants and it has always been in compliance with the terms set by the grantee agency.

iii. **Itemized costs:** This section provides an overview of the line item costs associated with the project. Greater cost detail is included in the project budget materials accompanying this submission and follows the EPA direction on budget categories. LRAPA has a negotiated indirect cost rate at 11.2% that was finalized in July 2018 by EPA and a copy will be included in the attachments of the project submission.

Program, infrastructure and supply costs ($3,406,100; 69% of total)

- Certified wood stoves: $580,000
- Weatherization and home repair: $1,450,000
- Ductless heat pumps: $652,500
- Air filters: $202,400
- Low cost PM sensors: $2,500
- School air filtering systems: $40,000
- EPA approved FRM Continuous PM Monitor: $38,000
- How-to guidebook for future replicability: $25,000
- Community firewood program equipment/materials: $300,500
- Education: $115,200

Personnel and staffing costs: ($1,432,000; 29% of total)

- LRAPA personnel: $250,500
- Contractors: $500,000
- Local code enforcement officer: $355,000

- Management and oversight of weatherization and heating system replacements: $326,500

Additional costs ($100,090; 2% of total)

- Fringe benefits: $67,640
- Indirect costs: $32,450

iv. Cost share is not included.

H. Leveraging Previous Contributions

For nearly the last three decades, many stakeholders have contributed substantially to address this challenge. We share this information to show the level of effort and the previous commitment and resources brought to this effort. We want to highlight that this *is not a commitment for further matching*. Rather, most of the contributing stakeholder organizations have contributed as much as they can, which is an important reason for our grant submittal. The following section outlines past funding and involvement from key partners:

- **Code enforcement:** LRAPA and Oakridge have co-funded an enforcement program that serves to educate as well as fine community members that burn inappropriately. Those that are fined are able to participate in a diversion program that offers a reduction in fines but requires participation in education on wood-burning and air quality.
- **LRAPA past investment:** LRAPA has been an important contributor to the efforts in Oakridge and has contributed $3.1 million between 1993 and 2017 and $112,200 in 2018. The table below illustrates the level of involvement that LRAPA has contributed.

Oakridge Category	Beginning	Through	Total Cost (Current $)	Notes	Annual 2017-2018
Woodstove Replacement Projects	1993	2011	$763,000	Projects in 1993-1996, 2006-2009, and 2010-2011.	$0
Air Quality Monitoring & Reporting	1987	2017	$1,800,000	Average of $60,000 per year. Periodic special studies.	$65,700
PM10 and PM2.5 Attainment Planning	1994	2017	$383,500	Attainment planning in 1994-1996, 2011-2012, and 2015-2017.	$27,500
Implementation (LRAPA rules, support to city staff)	1996	2017	$237,500	AQI, HWH forecasts, additional support of city staff in 2014-2017.	$19,000
Total	**1987**	**2017**	**$3,184,000**		**$112,200**

- **Lane Electric:** Since 2012, Lane Electric has installed ducted and ductless heat pumps for 124 regular and 55 low-income residents. The financial contribution for these installations is $321,500 ($112,500 for regular units, $209,000 for low-income). Oakridge residents contributed approximately $750,000 for these ducted and ductless systems.
- **Lane County Housing Authority – Homes for Good:** Since 2010, Homes for Good has weatherized 17 homes and served 45 heat crisis clients in the Oakridge/Westfir area. In 2018, Homes for Good installed 8 ductless heat pump units in low-income residences via special funding that the Oregon Solutions effort helped to access via Oregon Community and Housing Services (OCHS).
- **Lane County Economic Development –** Lane County invested $30,000 in the Community Firewood Program in 2018 for equipment purchases.
- **Oregon Department of Environmental Quality –** Woodsmoke Grant of $75,000 2017-2018 for contracted Woodsmoke Coordination.
- **Oregon Department of Forestry –** In 2018, $24,500 grant funding for Community Firewood Feasibility and business planning.